

Claims

We, the inventors, claim

1. An isolated and purified pathogenic bovine enterovirus.
2. The isolated and purified pathogenic bovine enterovirus of Claim 1 wherein said pathogenic bovine enterovirus has ATCC deposit number H-33555A.
3. The isolated and purified pathogenic bovine enterovirus of Claim 1 wherein said pathogenic bovine enterovirus is characterized as being insensitive to ether and having a size smaller than 30 nm, said pathogenic bovine enterovirus being specifically reactive with serum antibodies from a bovine, said serum antibodies obtained by intranasally inoculating a bovine with pathogenic bovine enterovirus ATCC deposit number H-33555A and collecting serum antibodies from the inoculated bovine 25 to 40 days after inoculation.
4. An immunogenic composition comprising the pathogenic bovine enterovirus of Claim 1 wherein said pathogenic bovine enterovirus has been attenuated.
5. An immunogenic composition comprising the pathogenic bovine enterovirus of Claim 1 wherein said pathogenic bovine enterovirus has been inactivated.
6. An immunogenic composition comprising the pathogenic bovine enterovirus of Claim 1 wherein said pathogenic bovine enterovirus has ATCC deposit number H-33555A and wherein said pathogenic bovine enterovirus has been attenuated or inactivated.
7. An immunogenic composition for generating an immune response in a bovine comprising: an inactivated virus which is the causative agent for pathogenic bovine enterovirus disease, said virus characterized as being insensitive to ether and having a size smaller than 30 nm, said virus being specifically reactive with serum antibodies from a bovine, said serum antibodies obtained by intranasally inoculating a bovine with pathogenic bovine enterovirus ATCC deposit number H-33555A and collecting serum antibodies from the inoculated bovine 25 to 40 days after inoculation.
8. An immunogenic composition for generating an immune response in a bovine comprising: an attenuated virus which is the causative agent for pathogenic bovine enterovirus disease, said virus characterized as being insensitive to ether and having a size smaller than 30 nm, said virus being specifically reactive with serum antibodies from a bovine, said serum antibodies obtained by intranasally inoculating a bovine with pathogenic

bovine enterovirus ATCC deposit number H-33555A and collecting serum antibodies from the inoculated bovine 25 to 40 days after inoculation.

9. A method for producing the immunogenic composition of Claim 4 comprising:
homogenizing tissue from bovine affected with pathogenic bovine enterovirus disease to form a homogenate which includes pathogenic bovine enterovirus; and
attenuating the pathogenic bovine enterovirus in the homogenate by a process comprising passaging the pathogenic bovine enterovirus through animal cells to form attenuated pathogenic bovine enterovirus which is non-zoopathogenic in bovine.
10. A method for producing the immunogenic composition of Claim 4 comprising:
passaging the pathogenic bovine enterovirus through animal cells to form attenuated pathogenic bovine enterovirus which is non-zoopathogenic in bovine.
11. A method for producing the immunogenic composition of Claim 5 comprising:
homogenizing tissue from bovine affected with pathogenic bovine enterovirus disease to form a homogenate which includes pathogenic bovine enterovirus;
inoculating a cell culture with the homogenate to grow up pathogenic bovine enterovirus;
harvesting pathogenic bovine enterovirus from the cell culture; and
inactivating the pathogenic bovine enterovirus by adding an inactivating agent.
12. A method for producing the immunogenic composition of Claim 5 comprising:
inactivating the pathogenic bovine enterovirus by adding an inactivating agent.
13. A method for diagnosing pathogenic bovine enterovirus disease in bovine comprising:
obtaining a lung tissue sample from the bovine;
forming a liquid homogenate of the sample;
immobilizing the liquid homogenate on a support;
adding a monoclonal antibody to the immobilized homogenate to form a complex with a viral agent in the liquid homogenate, wherein the monoclonal antibody specifically binds to a protein of pathogenic bovine enterovirus ATCC deposit number H-33555A; and
detecting the complex, wherein the presence of the complex is indicative of the presence of pathogenic bovine enterovirus disease.
14. A method for diagnosing pathogenic bovine enterovirus disease in bovine comprising:
forming a liquid homogenate of a tissue sample from the bovine suspected of being infected with pathogenic bovine enterovirus;
adding a monoclonal antibody to the liquid homogenate to form a precipitated complex with a viral agent in the homogenate, wherein the monoclonal antibody specifically binds to a protein of pathogenic bovine enterovirus ATCC deposit number H-33555A; and

detecting the precipitated complex, wherein the presence of the precipitated complex is diagnostic of pathogenic bovine enterovirus disease.

15. A method for diagnosing pathogenic bovine enterovirus disease in bovine comprising:
 - obtaining a lung tissue sample from the bovine;
 - forming a liquid homogenate of the tissue sample;
 - incubating the liquid homogenate with a cell preparation under conditions effective to culture the cells;
 - processing the cultured cells to provide a cell scraping;
 - immobilizing the cell scraping on a support;
 - adding a monoclonal antibody to the immobilized cells scraping to form a complex with a viral agent in the immobilized cells scraping, wherein the monoclonal antibody specifically binds to a protein of pathogenic bovine enterovirus ATCC deposit number H-33555A; and
 - detecting the complex, wherein the presence of the complex is diagnostic of pathogenic bovine enterovirus disease.
16. A method for diagnosing pathogenic bovine enterovirus comprising:
 - obtaining a lung tissue sample from a bovine;
 - immobilizing the lung tissue sample on a support;
 - adding a monoclonal antibody to the immobilized lung tissue sample to form a complex with a viral agent in the immobilized lung tissue sample, wherein the monoclonal antibody specifically binds to a protein of pathogenic bovine enterovirus ATCC deposit number H-33555A; and
 - detecting the complex, wherein the presence of the complex is diagnostic of pathogenic bovine enterovirus disease.
17. A method of generating an immune response in a bovine against pathogenic bovine enterovirus comprising administering the immunogenic composition of Claims 4, 5, or 6 to a bovine.
18. A monoclonal antibody that binds to a protein of pathogenic bovine enterovirus ATCC deposit number H-33555A.